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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,129	08/11/2006	Tomoichiro Tamura	060546	5766

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EXAMINER	
CARTON, MICHAEL	
ART UNIT	PAPER NUMBER
3744	

MAIL DATE	DELIVERY MODE
09/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,129	TAMURA ET AL.	
	Examiner	Art Unit	
	MICHAEL CARTON	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 5/12/2009 have been fully considered but they are not persuasive.

Applicant appears to argue that Lanciaux "itself mentions no heat exchanger" (Remarks, page 4, generally, 3rd paragraph, line 4) and then goes on to cite the condenser 150 and evaporator 151 in Lanciaux's heat pump system. Clearly, one of ordinary skill in the art would have recognized that the terminology "condenser" and "evaporator" are well known alternate names for a "heat exchanger." So, the argument that Lanciaux does not mention a heat exchanger is not persuasive.

With respect to the argument that there is no support in Lanciaux for a third heat exchanger, applicant is directed to annotated Figure 16 (included in the rejection below) that clearly teaches a third heat exchanger. Thus, the rejection is proper and remains.

With respect to the argument that Itoh fails to disclose a duct with a heat exchanger, the teaching for this limitation is taught by Lanciaux (144 fig 12). Furthermore, paragraphs 49 and 50 of Itoh disclose an air conditioning casing, 300 with inlets 301, 302. This is interpreted to be ductwork used to channel air flow.

Lastly, the applicant appears to assert that the third heat exchanger disclosed in Lanciaux is a lint screen 156, as illustrated in Figure 15. Examiner points out that the lint screen is illustrated in Figure 16 above heat exchanger 151, and the unnumbered element clearly embodies the notation for a heat exchanger, as recognized in the art, and thus, is interpreted as the third heat exchanger.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lanciaux (US Patent No. 4621438) in view of Itoh (US Publication No. 2002/0046570).

With respect to claim 1, Lanciaux discloses a drying apparatus 10 (fig 1) comprising a heat pump apparatus 142 (fig 15) in which a refrigerant is circulated (column 5 lines 6-11) through a compressor 149 (fig 15), a radiator 150 (fig 15), a first throttle apparatus 152 (fig 15), a heat exchanger (see fig 16 below), and an evaporator 151 (fig 16), a circulation duct 144 (fig 12) through which drying air is circulated and in which said radiator 150 (fig 15), said heat exchanger (see fig 16 below) and said evaporator 151 (fig 16) are disposed in this order from upstream side of flow of the drying air and a drying room 130 (fig 12) connected to said circulation duct 144 (fig 12), wherein the refrigerant in the heat exchanger absorbs heat from the drying air or radiates heat to the drying air (fig 17 and fig 18 disclose air with arrows, indicating air passing through condenser, evaporator and heat exchanger which clearly exchanges heat with the said devices). Lanciaux does not explicitly disclose a second throttle apparatus nor the parts of the heat pump apparatus as located in the order stated above. Itoh discloses refrigerant flow in cooling/heating apparatus comprising a compressor 110 (fig 9), a radiator 130 (fig 9), a first throttle apparatus 162a (fig 9), a heat exchanger 150 (fig 9), a second throttle apparatus 161 (fig

9), and an evaporator 120 (fig 9) in this order (see paragraph 58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lanciaux with a compressor, a radiator, a first throttle apparatus, a heat exchanger, a second throttle apparatus, and an evaporator, in this order, as taught by Itoh for the purpose of minimizing the amount of liquid phase refrigerant sucked into the compressor.

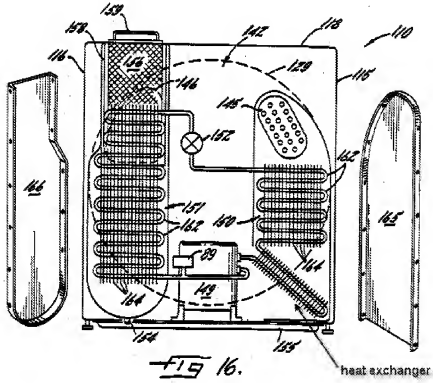

FIG 16.

With respect to claim 2, Lanciaux discloses an operating method of a heat pump apparatus in the drying apparatus according to claim 1, wherein said heat exchanger is used as a second evaporator or a second radiator by operating said first throttle apparatus and said throttle apparatus (column 10 lines 1-29).

With respect to claim 3, Lanciaux discloses the apparatus according to claim 1, further comprising discharge pressure detecting means for detecting discharge pressure of the

compressor (column 6 lines 40-48), and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said discharge pressure detecting means (column 10 lines 13-22).

With respect to claim 4, Lanciaux discloses the drying apparatus according to claim 1, further comprising discharge temperature detecting means for detecting discharge temperature of the compressor, and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said discharge temperature detecting means (column 10 lines 13-22).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lanciaux (US Patent No. 4621438) and Itoh (US Publication No. 2002/0046570) in further view of Honda (US Publication No. 2001/0018831).

With respect to claim 5, Lanciaux, as modified, discloses all claimed elements of the drying apparatus according to claim 1, except for an air temperature detecting means for detecting inlet air temperature of said evaporator, and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said air temperature detecting means. Honda discloses a heat pump controller system wherein an air temperature detecting means 28, 29, 32 (fig 2) for detecting inlet air temperature of said evaporator (paragraph 43), and throttle apparatus control means for controlling said first throttle apparatus 16 (fig 1) and said second throttle apparatus 17 (fig 1) using a detection value from said air temperature detecting means (paragraph 95 discloses capillary tubes 16 and 17 as throttles which respond to decompressing means paragraph 96 states the compressor is controlled by thermal load on vehicle interior which would correspond to temperature detecting means 28,

29, 32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lanciaux and Itoh, with an air temperature detecting means for detecting inlet air temperature of said evaporator, and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said air temperature detecting means as taught by Honda for the purpose of preventing the compressor from overworking, preventing failure.

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lanciaux (US Patent No. 4621438) in view of Itoh (US Publication No. 2002/0046570) in further view of Sakakibara (US Patent No. 6494051).

With respect to claim 6, Lanciaux discloses all claimed elements of the drying apparatus according to claim 1, except for a high pressure side of said heat pump apparatus is operated as a supercritical state. Sakakibara discloses a high pressure side of said heat pump apparatus is operated as a supercritical state (abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lanciaux with a high pressure side of said heat pump apparatus is operated as a supercritical state as taught by Sakakibara for the purpose of having a high heat exchange efficiency thus reducing power consumption.

With respect to claim 7, Lanciaux discloses all claimed elements of the drying apparatus according to claim 1, except for using carbon dioxide as the refrigerant. Sakakibara discloses a heat pump system where carbon dioxide is used as the refrigerant (column 7 lines 29-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lanciaux by using carbon dioxide as the refrigerant as taught by Sakakibara for the purpose of having a high heat exchange efficiency thus reducing power consumption.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL CARTON whose telephone number is (571)270-7837. The examiner can normally be reached on Monday-Friday 7:30am - 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571)272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. C./
Examiner, Art Unit 3744

/Cheryl J. Tyler/
Supervisory Patent Examiner, Art Unit 3744